

Type 285, 286, 287, 288

Pneumatically Actuated 3-Way Ball Valve

Standard Features

- **Size**
3/8"-2"
- **Material**
Horizontal - PVC, CPVC, PROGEF
Polypropylene
Vertical - PVC
- **Connection Ends**
Socket, Spigot (PVDF and PP only),
Threaded NPT
- **Seat**
PTFE
- **Seals**
EPDM or FPM
- **Mounting**
Stainless steel threaded inserts
for easy and secure mounting
- **Movement**
Fail open, fail closed,
and double acting
- **Mechanical**
Namur compliant air connection
and mounting console for
accessories such as positioner
and feedback switches
- **Visual position indicator**



Optional Features

- Pneumatic Actuation
- Limit Switches
- Positioner (voltage or current)
- Position Feedback

General

The Type 285-288 pneumatically actuated ball valve has a modular design and is adaptable to a variety of conditions and applications. Using the 543 3-way ball valve incorporates all the latest in ball valve technology. The valve is available in PVC, CPVC, Polypropylene, and PVDF materials. With the optional positioner, the valve can perform complex functions such as mixing chemicals or controlling process temperature by blending cooling water.

The system at a glance

The new three-way ball valve type 543 from GF Piping Systems offers a universal model series with a wide range of options for all versions – from the manual valve to the actuated. The ball valve is the perfect valve for demanding mixing and diverting processes. It follows the design of the ball valve type 546 and is available in the dimensions DN10 to DN50.

Horizontal or vertical: the perfect ball valve

The new 543 three-way ball valve provides quality, flexibility and reliability – in both the horizontal and the vertical versions. The horizontal version comes with an L or T bore and is available in PVC, CPVC, ABS, PP and PVDF. So you have the right valve for all your applications.

The vertical version of the 543 ball valve is available in the materials PVC and ABS. For

the vertical model, the third outlet consists of a solvent cement spigot in metric standard. As an additional version besides the L bore, we also offer a diverter ball for the ball valve.

International focus

Our global line of end connector options corresponds to ISO, BS, ASTM and JIS standards.

Standards and approvals

- EN ISO 16135: Industrial valves – Thermoplastic ball valves
- ISO 9393: Thermoplastic valves for industrial applications
- DIBt (Deutsches Institut für Bautechnik), pending
- NSF 61*: System components for drinking water, pending

*Only products bearing the NSF mark are certified.



Three-way ball valve with standard handle

Three-way ball valve with multifunctional handle

Three-way ball valve with pneumatic actuator

Three-way ball valve with electric actuator EA 21

Three-way ball valve with standard handle

Three-way ball valve vertical with standard handle

Three-way ball valve vertical with electric actuator EA 21

More Perfection in Detail

L-bore, 5 functions



Basic position for diverting function



Diverting function



Mixing function with reduced flow



Outlet closed, passage open with reduced flow



Shut-off function

T-bore, 4 functions



Basic position for mixing function



Outlet closed, passage open



Diverting function



Diverting function

Technical Specifications Pneumatic Actuators 11/21

PA 11/21		
	PA11/PA21	
Control Medium	neutral, non aggressive gases (max. 104°F)	
Operating pressure	60 psi	
Max. allowable operating pressure	100 psi	
Air connection	1/8" BSP (optional NPT adapter) Namur compliant	
Actuation time	1-2 seconds	
Actuation angle	90° F	
Mode of operation	- Fail-safe close (FC) - Fail-safe open (FO) - Double acting (DA)	
Operating temperature	14°F - 122°F	
Permissible humidity	0-100%	
Position indicator	visual	
Housing material	PP - glass filled	

Actuator size

	3/8	1/2	3/4	1	1 1/4	1 1/2	2			
Fail-safe close (FC)	PA 11	PA 11	PA 11	PA 11	PA 21	PA 21	PA 21			
Fail-safe open (FO)	PA 11	PA 11	PA 11	PA 11	PA 21	PA 21	PA 21			
Double acting (DA)	PA 11	PA 11	PA 11	PA 11	PA 21	PA 21	PA 21			

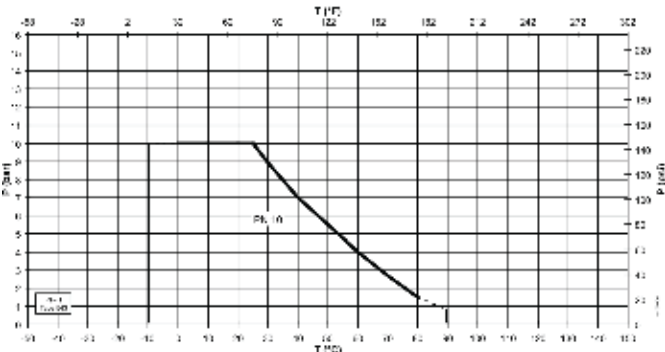
Operating air pressure

[psi]	3/8	1/2	3/4	1	1 1/4	1 1/2	2			
Fail-safe close (FC)	60	60	60	60	60	60	60			
Fail-safe open (FO)	60	60	60	60	60	60	60			
Double acting (DA)	60	60	60	60	60	60	60			

Pressure-temperature diagrams

The following pressure temperature diagrams are based on a lifetime of 25 years and the medium water or similar media.

PP-H

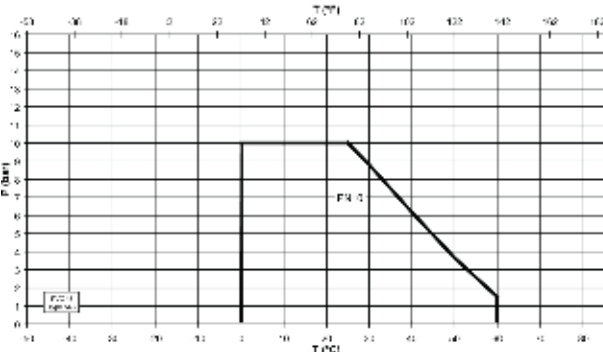


p Permissible pressure in bar, psi
T Temperature in °C, °F

For applications with temperatures in the range of the dotted lines, please contact your GF representative.

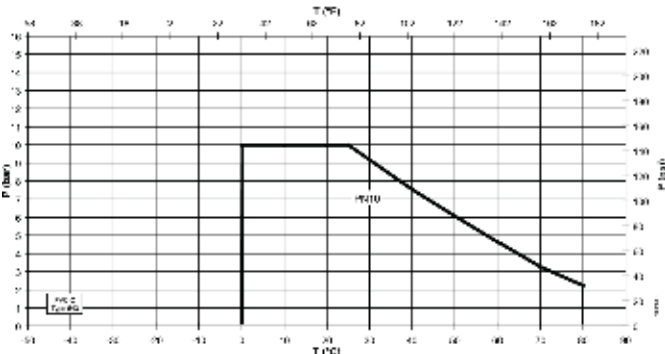
PVC-U

PVC-U



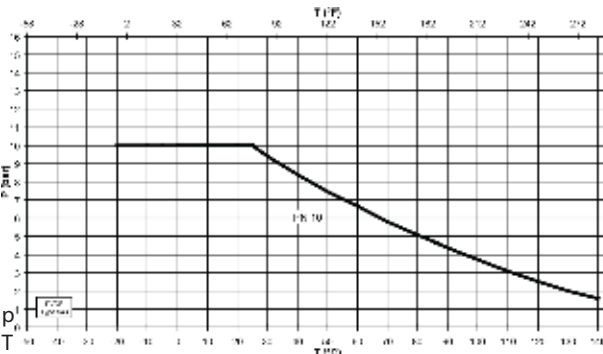
p Permissible pressure in bar, psi
T Temperature in °C, °F

PVC-C



p Permissible pressure in bar, psi
T Temperature in °C, °F

PVDF



p Permissible pressure in bar, psi
T Temperature in °C, °F
EPDM seal, max. 100 °C



Type 288 Pneumatically Actuated 3-way Ball Valve - PVC Vertical Manual override standard

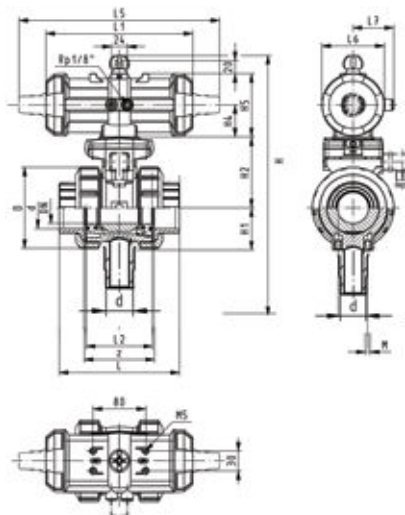
size	psi	Cv-value [gal(US)/min]
3/8	150	4
1/2	150	5
3/4	150	11
1	150	20
1 1/4	150	34
1 1/2	150	43
2	150	86

ASTM Socket

size	D	H	H1	H2	H5	L	L1	L2	L5	L6	L7	z
3/8	1.97	8.70	1.06	2.44	3.03	4.17	7.64	2.20	10.28	2.99	1.89	2.64
1/2	1.97	8.70	1.06	2.44	3.03	4.13	7.64	2.20	10.28	2.99	1.89	2.40
3/4	2.28	9.44	1.18	2.80	3.03	4.76	7.64	2.56	10.28	2.99	1.89	2.76
1	2.68	9.64	1.42	2.80	3.03	5.24	7.64	2.80	10.28	2.99	1.89	2.99
1 1/4	3.31	11.38	1.73	3.31	3.90	5.98	8.82	3.35	12.01	3.74	2.32	3.54
1 1/2	3.82	11.77	2.01	3.31	3.90	6.50	8.82	3.50	12.01	3.74	2.32	3.70
2	4.88	13.27	2.52	4.17	3.90	7.20	8.82	3.98	12.01	3.74	2.32	4.21

NPT Thread

size	D	H	H1	H2	H5	L	L1	L2	L5	L6	L7	z
3/8	1.97	8.70	1.06	2.44	3.03	3.86	7.64	2.20	10.28	2.99	1.89	2.64
1/2	1.97	8.70	1.06	2.44	3.03	3.86	7.64	2.20	10.28	2.99	1.89	2.40
3/4	2.28	9.44	1.18	2.80	3.03	4.41	7.64	2.56	10.28	2.99	1.89	2.76
1	2.68	9.64	1.42	2.80	3.03	5.00	7.64	2.80	10.28	2.99	1.89	2.99
1 1/4	3.31	11.38	1.73	3.31	3.90	5.75	8.82	3.35	12.01	3.74	2.32	3.54
1 1/2	3.82	11.77	2.01	3.31	3.90	6.18	8.82	3.50	12.01	3.74	2.32	3.70
2	4.88	13.27	2.52	4.17	3.90	7.20	8.82	3.98	12.01	3.74	2.32	4.21





Type 285 Pneumatically Actuated 3-way Ball-PVC/CPVC Horizontal With manual emergency override

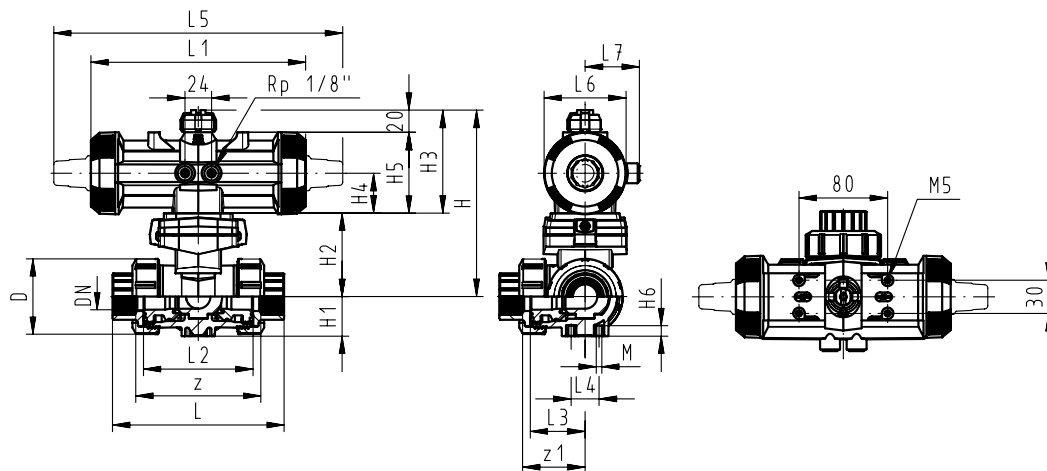
size	psi	Cv-value [gal(US)/min]
3/8	150	4
1/2	150	5
3/4	150	11
1	150	20
1 1/4	150	34
1 1/2	150	43
2	150	86

ASTM Socket

size	D	H	H1	H2	H3	H4	H5	H6	L	L1	L2	L3	L4	L5	L6	L7	M	z	z1
3/8	1.97	6.26	1.10	2.44	3.82	1.57	3.03	0.31	4.84	7.64	2.87	1.42	0.98	10.28	2.99	1.89	6	3.35	1.65
1/2	1.97	6.26	1.10	2.44	3.82	1.57	3.03	0.31	4.80	7.64	2.87	1.42	0.98	10.28	2.99	1.89	6	3.03	1.50
3/4	2.28	6.61	1.26	2.80	3.82	1.57	3.03	0.31	5.55	7.64	3.39	1.69	0.98	10.28	2.99	1.89	6	3.62	1.81
1	2.68	6.61	1.42	2.80	3.82	1.57	3.03	0.31	6.34	7.64	3.90	1.97	0.98	10.28	2.99	1.89	6	4.13	2.09
1 1/4	3.31	7.99	1.77	3.31	4.69	2.01	3.90	0.35	7.36	8.82	4.72	2.36	1.77	12.01	3.74	2.32	8	4.96	2.48
1 1/2	3.82	7.99	2.01	3.31	4.69	2.01	3.90	0.35	8.39	8.82	5.39	2.72	1.77	12.01	3.74	2.32	8	5.63	2.83
2	4.88	8.86	2.56	4.17	4.69	2.01	3.90	0.35	10.28	8.82	7.05	3.50	1.77	12.01	3.74	2.32	8	7.28	3.62

NPT Thread

NPT	D	H	H1	H2	H3	H4	H5	H6	L	L1	L2	L3	L4	L5	L6	L7	M	z	z1
3/8	1.97	6.26	1.10	2.44	3.82	1.57	3.03	0.31	4.53	7.64	2.87	1.42	0.98	10.28	2.99	1.89	6	3.43	1.69
1/2	1.97	6.26	1.10	2.44	3.82	1.57	3.03	0.31	4.49	7.64	2.87	1.42	0.98	10.28	2.99	1.89	6	3.19	1.57
3/4	2.28	6.61	1.26	2.80	3.82	1.57	3.03	0.31	5.16	7.64	3.39	1.69	0.98	10.28	2.99	1.89	6	3.78	1.89
1	2.68	6.61	1.42	2.80	3.82	1.57	3.03	0.31	6.10	7.64	3.90	1.97	0.98	10.28	2.99	1.89	6	4.37	2.20
1 1/4	3.31	7.99	1.77	3.31	4.69	2.01	3.90	0.35	7.13	8.82	4.72	2.36	1.77	12.01	3.74	2.32	8	5.28	2.64
1 1/2	3.82	7.99	2.01	3.31	4.69	2.01	3.90	0.35	8.07	8.82	5.39	2.72	1.77	12.01	3.74	2.32	8	6.26	3.15
2	4.88	8.86	2.56	4.17	4.69	2.01	3.90	0.35	10.28	8.82	7.05	3.50	1.77	12.01	3.74	2.32	8	8.39	4.17



Type 286 &287 Pneumatically Actuated 3-way Ball-Polypropylene/PVDF Horizontal With manual emergency override



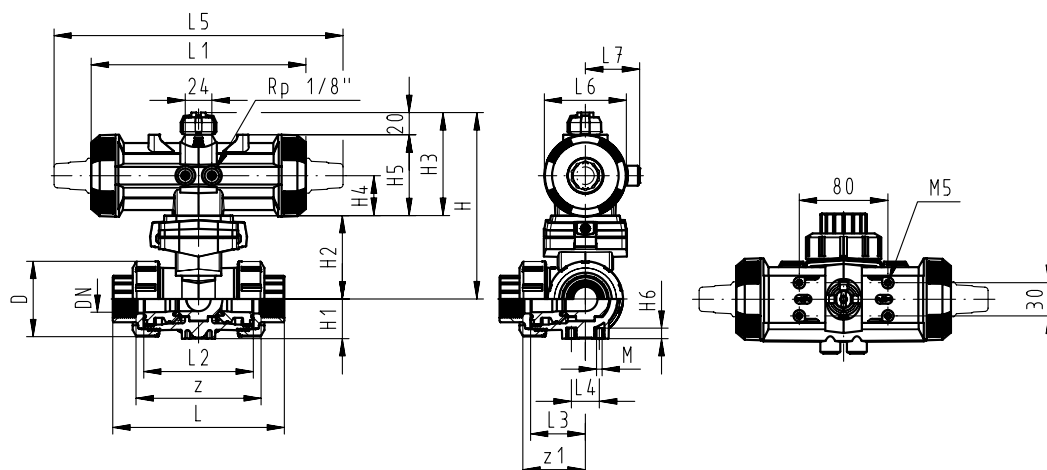
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3/8	150	4
1/2	150	5
3/4	150	11
1	150	20
1 1/4	150	34
1 1/2	150	43
2	150	86

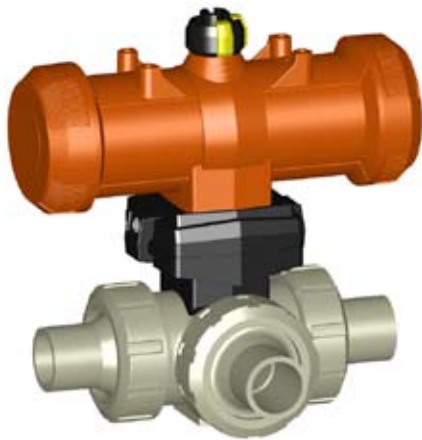
Metric Socket

size	D	H	H1	H2	H3	H4	H5	H6	L	L1	L2	L3	L4	L5	L6	L7	M	z	z1
3/8	1.97	6.26	1.10	2.44	3.82	1.57	3.03	0.31	4.33	7.64	2.83	1.42	0.98	10.28	2.99	1.89	6	3.23	1.61
1/2	1.97	6.26	1.10	2.44	3.82	1.57	3.03	0.31	4.41	7.64	2.83	1.42	0.98	10.28	2.99	1.89	6	3.23	1.61
3/4	2.28	6.61	1.26	2.80	3.82	1.57	3.03	0.31	5.08	7.64	3.35	1.69	0.98	10.28	2.99	1.89	6	3.82	1.93
1	2.68	6.61	1.42	2.80	3.82	1.57	3.03	0.31	5.75	7.64	3.86	1.93	0.98	10.28	2.99	1.89	6	4.33	2.17
1 1/4	3.31	7.99	1.77	3.31	4.69	2.01	3.90	0.35	6.69	8.82	4.65	2.32	1.77	12.01	3.74	2.32	8	5.20	2.60
1 1/2	3.82	7.99	2.01	3.31	4.69	2.01	3.90	0.35	7.60	8.82	5.31	2.68	1.77	12.01	3.74	2.32	8	5.94	2.99
2	4.88	8.86	2.56	4.17	4.69	2.01	3.90	0.35	9.61	8.82	6.93	3.46	1.77	12.01	3.74	2.32	8	7.40	3.70

NPT Thread

NPT	D	H	H1	H2	H3	H4	H5	H6	L	L1	L2	L3	L4	L5	L6	L7	M	z	z1
3/8	1.97	6.26	1.10	2.44	3.82	1.57	3.03	0.31	4.41	7.64	2.83	1.42	0.98	10.28	2.99	1.89	6	3.39	1.61
1/2	1.97	6.26	1.10	2.44	3.82	1.57	3.03	0.31	4.49	7.64	2.83	1.42	0.98	10.28	2.99	1.89	6	3.15	1.57
3/4	2.28	6.61	1.26	2.80	3.82	1.57	3.03	0.31	5.16	7.64	3.35	1.69	0.98	10.28	2.99	1.89	6	3.74	1.89
1	2.68	6.61	1.42	2.80	3.82	1.57	3.03	0.31	6.06	7.64	3.86	1.93	0.98	10.28	2.99	1.89	6	4.33	2.17
1 1/4	3.31	7.99	1.77	3.31	4.69	2.01	3.90	0.35	7.09	8.82	4.65	2.32	1.77	12.01	3.74	2.32	8	5.20	2.60
1 1/2	3.82	7.99	2.01	3.31	4.69	2.01	3.90	0.35	7.99	8.82	5.31	2.68	1.77	12.01	3.74	2.32	8	6.18	3.11
2	4.88	8.86	2.56	4.17	4.69	2.01	3.90	0.35	10.16	8.82	6.93	3.46	1.77	12.01	3.74	2.32	8	8.27	4.13





d [mm]	DN [inch]	Cv-value [gal(US)/min]	lbs
1/2	150	5	2.295
3/4	150	11	2.502
1	150	20	2.789
1 1/4	150	34	4.918
1 1/2	150	43	5.631
2	150	86	7.721

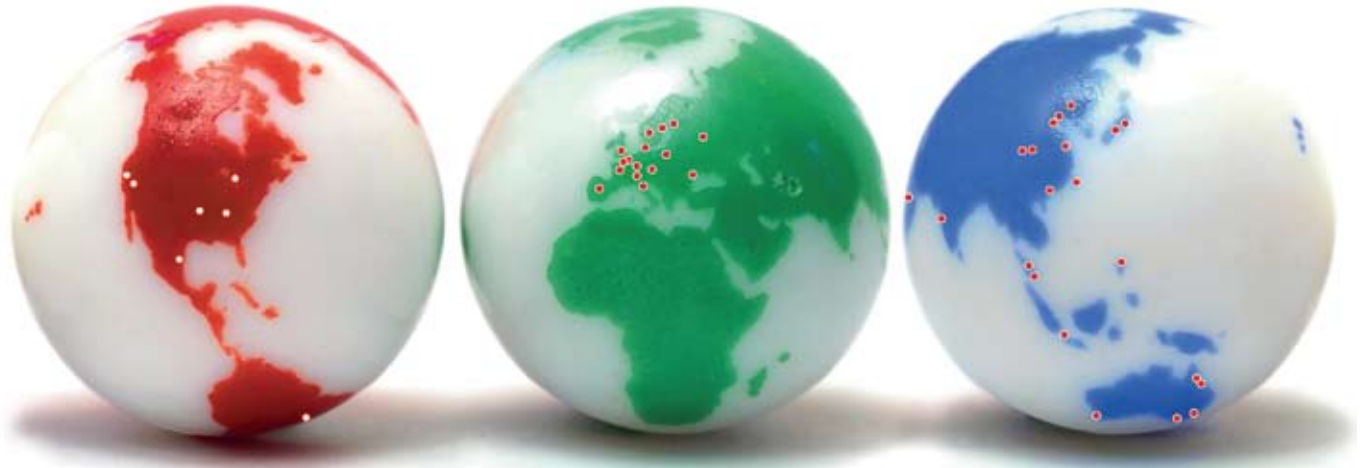
Butt Fusion Spigots

d	D	H	H1	H2	H3	H4	H5	H6	L	L1	L2	L3	L4	L5	L6	L7	M	closest inch
20	1.97	6.26	1.10	2.44	3.82	1.57	3.03	0.31	5.75	7.64	2.83	1.42	0.98	10.28	2.99	1.89	6	1/2
25	2.28	6.61	1.26	2.80	3.82	1.57	3.03	0.31	6.42	7.64	3.35	1.69	0.98	10.28	2.99	1.89	6	3/4
32	2.68	6.61	1.42	2.80	3.82	1.57	3.03	0.31	7.01	7.64	3.86	1.93	0.98	10.28	2.99	1.89	6	1
40	3.31	7.99	1.77	3.31	4.69	2.01	3.90	0.35	8.03	8.82	4.65	2.32	1.77	12.01	3.73	2.32	8	1 1/4
50	3.82	7.99	2.01	3.31	4.69	2.01	3.90	0.35	9.33	8.82	5.31	2.68	1.77	12.01	3.73	2.32	8	1 1/2
63	4.88	8.86	2.56	4.17	4.69	2.01	3.90	0.35	11.65	8.82	6.93	3.46	1.77	12.01	3.73	2.32	8	2

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